

REMARKS

As a preliminary, Applicant and Applicant's representative thank the Examiner for the interview of July 8, 2009.

By the present amendment, claim 1 has been amended as follows (support for the changes is found in the original application, for example, in the passages indicated in parenthesis):

- present the claim with separate paragraphs,
- delete the recitation that the first authentication element is absent from the second ply at the end of the claim, and add a corresponding recitation that the first authentication element is substantially absent from the second ply in the paragraph defining the first ply,
- clarify that the fibrous paper plies have a fibrous structure comprising fibers,
- recite that the first authentication element comprises at least one of (i) authentication particles, and (ii) authentication fibers different from the fibers of the fibrous structure of the first ply, said first authentication element of the first ply being substantially absent from the second ply (see, e.g., page 5, lines 15-18),
- delete the alternative recitation of a reinforcing element,
- recite that the second authentication element comprises at least one of (i) authentication particles, and (ii) authentication fibers different from the fibers of the fibrous structure of the second ply (see, e.g., page 5, lines 6-13),

- recite that each of the first and second authentication elements are selected from the group consisting of the elements recited in claims 5-7.

Claim 3-4, 12-13 and 17 have been amended accordingly.

Claim 3 has been amended to replace “in particular they” by “and said polyester fibers.”

Claim 13 has been amended to replace “that may be” by “is.”

Claims 5-8 and 19-22 have been canceled without prejudice or disclaimer.

Claim 15 has been redrafted as a product claim, and claim 16 has been redrafted to recite the process previously recited in claim 15, with the assembling step recited more actively.

New claims 23-24 dependent on claim 1 have been added to recite flakes (see, e.g., claim 5) and that the second authentication element is substantially absent from the first ply ((see, e.g., page 5, lines 6-13)).

New claim 25 has been added. Claim 25 corresponds to claim 1 except as follows (support for the changes is found in the original application, for example, in the passages indicated in parenthesis):

- recite that the first authentication element is a watermark (see, e.g., claim 8),
- maintain the recitation of a reinforcing element and delete the recitation of a second authentication element,
- recite that the reinforcing element is fibers different from the fibers of the fibrous structure of the second ply, and that the reinforcing element is selected from the group consisting of synthetic fibers, natural textile fibers, and mixtures thereof (see, e.g., claim 2),

- delete the recitation that the reinforcing element is chosen from materials that improve the mechanical strength, and recite that the reinforcing element is such that the paper has a mechanical strength higher than a mechanical strength of a paper having identical weight in g/m² and identical composition except without the reinforcing element. (see, e.g., page 13, lines 26-30 and page 14, Table 1).

New claims 26-39 dependent directly or indirectly on claim 25 have been added. Support for the new claims is found in the original claims, in particular claim 2, 3, 4, 5-7, 8, 9, 11, 12, 13, 14, and 15-16, respectively.

Objections

In the Office Action, the amendment to the specification is objected to as referencing both the fluorescent fibers and the second ply with numeral 2 and as reciting “said second authentication element of said first ply.”

The specification has been amended to reference the fluorescent fibers 6 as in the drawings, and claim 4 has been amended to recite “the second authentication element of the second ply” as suggested in the Office Action. Accordingly, it is submitted that the objection should be withdrawn.

Art rejections

In the Office Action, the following rejections are set forth:

- Claims 1-10, 12-14, and 18-22 are rejected under 35 U.S.C. 103(a) as obvious over US 5,565,276 to Murakami et al. (“Murakami”) in view of US 4,720,325 to Rausing et al. (“Rausing”).

- Claims 1 and 15-16 are rejected under 35 U.S.C. 103(a) as obvious over Murakami in view of US 4,552,617 to Crane et al. (“Crane”).
- Claim 11 is rejected under 35 U.S.C. 103(a) as obvious over Murakami in view of Rausing and further in view of “Nordic Pulp and Paper Research”.
- Claim 17 is rejected under 35 U.S.C. 103(a) as obvious over Murakami in view of Rausing and further in view of US 6,491,324 to Schmitz et al. (“Schmitz”).

Reconsideration and withdrawal of the rejections is respectfully requested. Fig. 5 of Murakami discloses a two-ply paper with a first ply 10 and a second ply 20, and nacreous pigment flakes in the first ply 10. Murakami at col. 7, lines 10-14 suggests additional authentication elements such as watermarks or dyed fibers, but Murakami does not specify how or where such additional authentication elements should be added. Further, Murakami uses apparently a same paper stock (i.e., fibrous structure) for both layers, i.e., Murakami is completely silent regarding using different paper stocks for the two different plies 10 and 11.

In contrast, in the present invention as claimed in present claim 1, two different authentication elements are used, the authentication elements being as defined in present claim 1, with the first being present in its ply and substantially absent from the other ply. An advantage of this feature is that detection of the authentication elements is markedly improved, as explained in the present specification, for example, on page 11, lines 15-25. In particular, detection of the different authentication elements is possible from different sides of the security document, and detection of the different authentication elements is thus more easily individualized, for example, with green and red fluorescent flakes as in Example 3.

This feature of the present invention is not taught or suggested in Murakami. In particular, this feature would not be inherent in Murakami because Murakami clearly teaches that the authentication element should be provided in the “thin” ply 10. Thus, the person of ordinary skill in the art reading Murakami would follow Murakami’s teachings of using the thinner ply 10 to disperse the authentication element as close to the outside surface of the thin ply 10 in order to improve detection, the thicker ply 20 being provided as a support according to Murakami. Accordingly, another authentication element as mentioned at col. 7 of Murakami that is a particle or fiber would not be inherently or purposefully provided in the “thick” layer (see in particular Murakami’s teaching that nacreous pigmenet should be in layer 10 at col. 6, lines 65-67, and Murakami’s teaching that nacreous pigment should preferably be close to or on surface of substrate sheet at col. 6, lines 12-15).

Further, the other cited references fail to remedy the deficiencies of Murakami. Thus, the present inventors have provided the invention as recited in present claim 1 contrary to the teaching in the art, with the unexpected result of making improved and individualized detection of plural authentication elements possible. Therefore, present claim 1 and the claims dependent directly or indirectly thereon are not obvious over the cited references taken alone or in any combination.

Turning to the present invention as claimed in present claim 25, the first ply has a watermark substantially absent from the second ply and the second ply has a reinforcing element, and the reinforcing element is substantially absent from the first ply. The reinforcing element is a fiber selected from the group consisting of synthetic fibers, natural textile fibers, and mixtures

thereof, and it is provided in the second ply such that the paper has a mechanical strength higher than a mechanical strength of a paper having identical weight in g/m² and identical composition except without the reinforcing element.

An advantage of this feature is that the definition of the watermark can be markedly improved while simultaneously providing high mechanical strength to the paper, as explained in the present specification, for example, on page 13, lines 23-34 and as illustrated on page 14, Table 1.

This feature of the presently claimed invention and its advantages are not taught or suggested in Murakami, which only mentions watermarks briefly at col. 7, and which is completely silent regarding the difficulty of providing good definition to a watermark when a paper must be reinforced with reinforcing fibers, let alone regarding any suggestion of providing different paper bases for the different plies. Thus, it is submitted that Murakami does not provide any guidance to the person of ordinary skill in the art regarding whether to provide a watermark in the thicker layer, i.e., ply 20 or in the thinner layer, i.e., ply 10. In addition, Murakami does not provide any guidance regarding whether and how to modify the paper stock of plies 10 and 20. Still further, there would have been no motivation or incentive to replace or supplement the pigment flakes of Murakami. The pigment flakes of Murakami are dispersed in the ply 10 and do not participate to its reinforcement. Also, there would have been no incentive or motivation to add reinforcing fibers that improve mechanical strength of the paper in one ply 10 or 20 and not in the other ply. Murakami uses the same paper stock for both layer (see, e.g., Murakami at co. 6, lines 48-51) and is completely silent regarding any advantage or benefit of

selective addition of reinforcing fibers, let alone a specific benefit in terms of a watermark definition.

Further, the other references fail to remedy the deficiencies of Murakami. Thus, the present inventors have provided the invention as recited in present claim 25 contrary to the teaching in the art, with the unexpected result that both the mechanical strength of the paper and the rendition of the watermark can be markedly improved, as compared, not only to a paper having no reinforcing paper, but also to a paper having reinforcing fibers throughout, as illustrated on page 14, Table 1 of the present specification. Therefore, present claim 25 and the claims dependent directly or indirectly thereon are not obvious over the cited references taken alone or in any combination.

In addition, with respect to the dependent claims, it is submitted that the cited references taken alone or in any combination fail to teach or suggest the combined features of each of these respective claims.

In particular, with respect to claim 24, it is submitted that providing the first and second authentication elements substantially completely separated in distinct layers makes it possible to further improve individualized detection of the first and second authentication elements from distinct outside surfaces of the security paper.

Therefore, each of the dependent claims is not obvious over the cited references taken alone or in any combination.

In view of the above, it is submitted that the rejections should be withdrawn.

Conclusion

In conclusion, the invention as presently claimed is patentable. It is believed that the claims are in allowable condition and a notice to that effect is earnestly requested.

If there is, in the Examiner's opinion, any outstanding issue and such issue may be resolved by means of a telephone interview, the Examiner is respectfully requested to contact the undersigned attorney at the telephone number listed below.

If this paper is not considered to be timely filed, the Applicants hereby petition for an appropriate extension of the response period. Please charge the fee for such extension and any other fees which may be required to Deposit Account No. 50-2866.

Respectfully submitted,

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